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FEASIBILITY OF ESTABLISHING ALFALFA DEHYDRATING PLANTS

in Northwest Resource Conservation and Development Project Areas

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.S. DEPARTMENT OF AGRICULTURE ECONOMIC RESEARCH SERVICE

PREFACE

This study is part of the Resource Conservation and Development Projects Program of the U. S. Department of Agriculture. It was carried out in accordance with a Memorandum of Understanding between the Economic Research Service and the Soil Conservation Service, December 1963. The study has benefited from the cooperation of Government, local, and industry people, including the American Dehydrators Association, Allied Mills, and the Delta Milling Company.

Washington, D. C. July 1966

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SUMMARY

The most suitable size for a dehydrating plant in the Upper Willamette Resource Conservation and Development (RC&D) project area appears to be a 1-drum unit, with a production capacity of 1.25 tons per hour, producing approximately 3,000 tons per year. A 1-drum plant requires a capital investment of approximately $160,000. Total operating costs are approximately $111,000 per year or $37 per ton.

There are presently only about 2,500 acres of alfalfa scattered through the Upper Willamette RC&D project, but the area has the potential to expand this acreage considerably and obtain the concentration of acreage required to support efficient operation of dehydrating facilities. Approximately 52,000 acres of alfalfa-grass and 16,000 acres of clover-grass forage are now grown in the Idaho-Washington RC&D project area. Only a portion of the present acreage is now harvested mechanically. There is very little potential for adequate forage production for a dehydration operation without irrigation development.

The feasibility of establishing dehydrating plants in the Upper Willamette RC&D project area is supported by several factors. The area has (1) high yields of alfalfa per acre, (2) a long production season, and (3) concentrated areas of suitable acreage. Before investment is made in a dehydrating operation, commitments should be obtained for the production.

Under current conditions, establishment of alfalfa dehydrating plants would not be feasible in the Idaho-Washington RC&D project area because (1) yields are low there; (2) generally, only one cutting per year is possible without irrigation; (3) most farmers now grow alfalfa-grass mixtures which have low protein content; (4) steep slopes, suitable for crop conversions to reduce erosion, cause high harvesting and hauling costs; and (5) market potentials are restricted by the limited livestock industry in the area.

FEASIBILITY OF ESTABLISHING ALFALFA DEHYDRATING PLANTS IN NORTHWEST RESOURCE CONSERVATION AND DEVELOPMENT PROJECT AREAS

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INTRODUCTION

A Resource Conservation and Development (RC&D) project is a locally initiated and sponsored activity. Its purpose is to expand the economic opportunities for the people of an area by developing and carrying out a plan of action for the orderly conservation, improvement, development, and wise use of their natural resources.

Ten RC&D projects were authorized for planning in 1963. Sponsors of two of these, the Upper Willamette and Idaho-Washington RC&D projects, are considering increased alfalfa production as one possibility for economic expansion. The purpose of this study is to evaluate the feasibility of establishing alfalfa dehydrating plants within these project areas. The findings of this report can be applied to other areas as well.

ALFALFA PRODUCTION POTENTIALS

Basically, alfalfa is a roughage feed ingredient which can be utilized in varying quantities by all classes of livestock and poultry. Alfalfa is dehydrated naturally by suncuring, mainly in California and Arizona, and artificially in dehydrating plants. Dehydrated alfalfa is marketed in a number of processed forms, including meal, granules, pellets, and reground pellets. 1/

The Upper Willamette RC&D Project Area, Oregon

The Upper Willamette area is a major source of the Nation's rye grass production. Prices of rye grass seed are currently low and unstable due to yield fluctuations and general overproduction. Alfalfa production in rotation is a possible alternative which may improve and stabilize farm income.

Alfalfa is presently harvested from approximately 2,500 acres scattered through the area. However, the area has 82,000 acres of irrigated land and 98,000 acres of nonirrigated land which is suitable for alfalfa production. Sizable programs of flood control and water management are currently being

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1/ Statistics on dehydrated alfalfa also include clover and other field-chopped forages. These are a very small proportion of the total production.

carried out in the area by the U. S. Department of Agriculture and the Corps of Engineers. These programs will significantly increase the acreage suitable for alfalfa production.

Rains hamper alfalfa haying operations during the first cutting in June, and often discourage the fourth cutting late in the growing season. Some farmers now reduce quality losses by ensiling the first and fourth cuttings. In 1964, yields averaged 4 tons per acre. Through improved management and timely removal of green forage, yields of 4.25 to 5 tons per acre, now exceeded by some farmers, may easily be attainable on a wide scale.

The market for alfalfa hay in this project area fluctuates seasonally. During the 1964-65 feeding season, hay sold for $22 per ton in the field and from $27 to $30 in the stack. During a normal year, Linn and Lane Counties import hay while Benton County exports its products (4). 2/ Hay is imported along the Oregon coast immediately to the west of the project area.

Many part-time farmers in the project area are unable to conduct timely hay harvesting operations in their spare time. Many full-time farmers use alfalfa in rotation but regard hay harvesting as a nuisance. If the forage were sold in the stand and harvested by plant field crews, individual harvesting problems would be eliminated and higher farm income could result.

The Idaho-Washington RC&D Project Area

The dominant crop in this area is wheat. Forage crops, including alfalfa, have been relatively unimportant and largely confined to steeply sloping soils where annual erosion losses are high. Much of the forage now grown is not harvested due to the steepness of topography, seasonal labor shortage, and marketing conditions. Improved market channels or expansion of the livestock industry could improve the economic returns from the acreage protected from erosion.

The normal acreage of alfalfa or alfalfa-grass mixtures in the project area is about 41,000 acres; 16,000 acres are in clover-grass mixtures (table 1). Potentially, 170,000 acres could be planted to alfalfa or legume-grass mixtures. Half of this could be harvested mechanically and the other half pastured.

Currently, yields average 1.5 tons per acre and are harvested in one cutting. Harvesting operations are complicated by June rains which reduce quality. There is no appreciable potential for additional cuttings or increased yields without supplemental irrigation.

In a normal year, hay is exported from Kootenai and Latah Counties (4). Locally produced hay sells at about $18 per ton, in competition with high-quality hay from the Columbia Basin which sells at $20 per ton.

2/ Underscored numbers in parentheses refer to items in the Selected References, p. 14.

Table 1.--Normal acreage of alfalfa-grass and clover-grass mixtures in the Idaho-Washington RC&D project area

Soil and Water Conservation Districts	Alfalfa-grass	Clover-grass
	Acres	Acres
Kootenai	14,000	5,000
Benewah	2,200	4,170
Latah	15,500	4,360
Latah-Rock Creek	9,700	2,700
Total	41,400	16,230

Source: De Wolfe (4).

There are many part-time farmers, employed during the summer in the forest-based industries, who are unable to carry out timely harvesting operations. For full-time farmers, hay production is often a break-even proposition. It is estimated that with a yield of 1.5 tons production costs vary from $18 to $21 per ton.

If the forage could be sold in the stand and harvested by plant field crews, harvesting costs incurred by both part- and full-time farmers could be eliminated. Such costs are estimated as follows:

Mowing	$1.00 per ton
Raking	1.00 per ton
Baling	4.50 per ton
Hauling and stacking	2.50 per ton
Total harvesting cost	$9.00 per ton

If the farmer could be relieved of the harvesting operation, he could sell hay at about $10 per ton in the stand and realize the same net income per acre without problems of seasonal labor shortage.

DEHYDRATING PLANT ANALYSIS

The most feasible size of dehydrating plant for these areas would probably be a 1-drum unit with a capacity of about 1.25 tons per hour, processing around 3,000 tons of dehydrated meal annually. Cost studies were made for this size of plant in the North Central States in 1954, 1958, and 1959. From these studies and other available data, it was possible to budget the 1964 operating costs for a 1-drum dehydrating plant. Both field and plant costs were taken into consideration in determining total processing costs.

Capital investment is a primary consideration in determining the feasibility of a processing plant. Table 2 shows total capital investment in a

Table 2.--Capital investment for dehydrating alfalfa, 1964

Item	Capital investment	
	1-drum plant, 1.25 ton per hour capacity 1/	2-drum plant, 3 ton per hour capacity 2/
	Dollars	Dollars
Field equipment	27,090	43,000
Plant equipment	74,966	118,700
Land, building, and storage	42,697	91,000
Working capital	16,415	35,000
Total	161,168	287,700

1/ Data budgeted from North Central States studies.
2/ Data developed by Northern Natural Gas Co. of Omaha, Nebr.

1-drum plant to be approximately $161,000. A 2-drum plant requires total capital investment of about $287,000, or 44 percent more than for the 1-drum plant. Investment in plant equipment is the largest initial expense in both plants, while working capital is the smallest.

The capacity of a drier is frequently described in terms of tons of dried material processed per hour under specific conditions. This method of rating can be misleading unless reference is also made to the initial moisture content of the forage. Most dehydrators now in use are rated by manufacturers to evaporate 6,000 to 12,000 pounds of water per hour from material passing through them. The moisture content of alfalfa differs according to the season and the time of day at which it is cut.

The following formula may be used to compute the input of uncured alfalfa necessary to produce a ton of dehydrated alfalfa:

$$\frac{\text{Lbs. of dry matter in a ton of dehydrated alfalfa}}{\text{1.00 minus \% moisture content of alfalfa forage}} = \begin{array}{c}\text{Total lbs. of alfalfa forage}\\ \text{required to produce a ton}\\ \text{of dehydrated alfalfa}\end{array}$$

Example:

(a) $\frac{1,840}{.368}$ = 5,000 pounds of alfalfa of 63.2-percent moisture content; and

(b) $\frac{1,840}{.262}$ = 7,000 pounds of alfalfa of 73.8-percent moisture content.

One ton of dehydrated alfalfa requires from 2.5 to 3.5 tons of field-chopped alfalfa, depending on the moisture content.

Dehydrating plants commonly process 24 hours per day and 6 days per week. Shutdowns are expensive and are avoided whenever possible.

The annual operating costs of a 1-drum plant would be about $111,000, or approximately $37 per ton at a production of 3,000 tons (table 3). A 2-drum plant producing 7,200 tons per year would reduce average per ton costs to about $32. Until farmers reorganize their forage production programs, the dehydrating enterprise would entail less risk if it were to begin at a lower level of production.

Given the market price and costs for a specified size of plant, a break-even chart can be used to estimate profit or loss at different levels of sales (fig. 1).

Assumptions:

1. A single-drum plant with a practical range of production from 2,000 to 4,000 tons annually.

2. Variable costs per unit decline as production increases through the 2,000- to 4,000-ton range.

Variable costs are estimated as follows:

2,000 tons - $26.34 per ton
3,000 tons - $25.25 per ton
4,000 tons - $24.57 per ton

3. Total return lines: Sale price per ton equals $37 and $44.

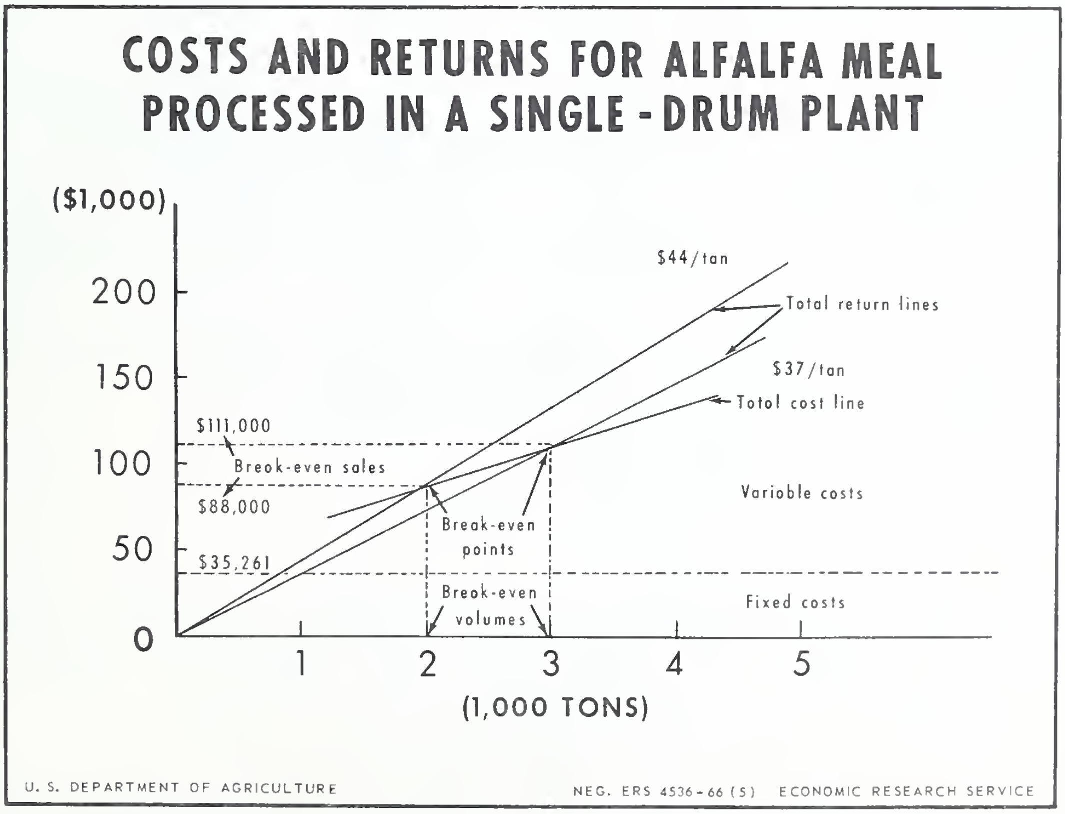


Figure 1

Table 3.--Production costs of 1-drum and 2-drum plants, for dehydrated alfalfa, 1964 1/

Cost	1-drum plant, 1.25 tons per hour capacity, 3,000 tons per year 2/		2-drum plant, 3 tons per hour capacity, 7,200 tons per year 3/	
	Total cost	Average cost per ton	Total cost	Average cost per ton
	Dollars	Dollars	Dollars	Dollars
Fixed cost:				
Depreciation	10,855	3.62	19,000	2.64
Insurance	1,612	.54	3,000	.42
Property taxes	854	.28	2,000	.28
Manager's salary 4/	2,814	.94	6,000	.83
Interest on investment	8,058	2.68	14,500	2.01
Administration and overhead	1,688	.56	3,600	.50
Sales and advertising	9,380	3.13	20,000	2.78
Total fixed cost	35,261	11.76	68,100	9.46
Variable cost:				
Hay	30,000	10.00	72,000	10.00
Labor	12,300	4.10	24,408	3.39
Natural gas	13,170	4.39	28,080	3.90
Electricity	5,065	1.69	10,800	1.50
Gas and oil	5,065	1.69	10,800	1.50
Maintenance	7,237	2.41	12,600	1.75
Other material 5/	2,904	.97	6,192	.86
Total variable cost	75,741	25.25	164,880	22.90
Total production cost	111,002	37.01	232,980	32.36

1/ Includes costs for field, trucking, and plant operations.
2/ Data budgeted from North Central States studies.
3/ Data developed by Northern Natural Gas Co. of Omaha, Nebr.
4/ Salary for a normal length run.
5/ Includes inert gas storage and antioxidant.

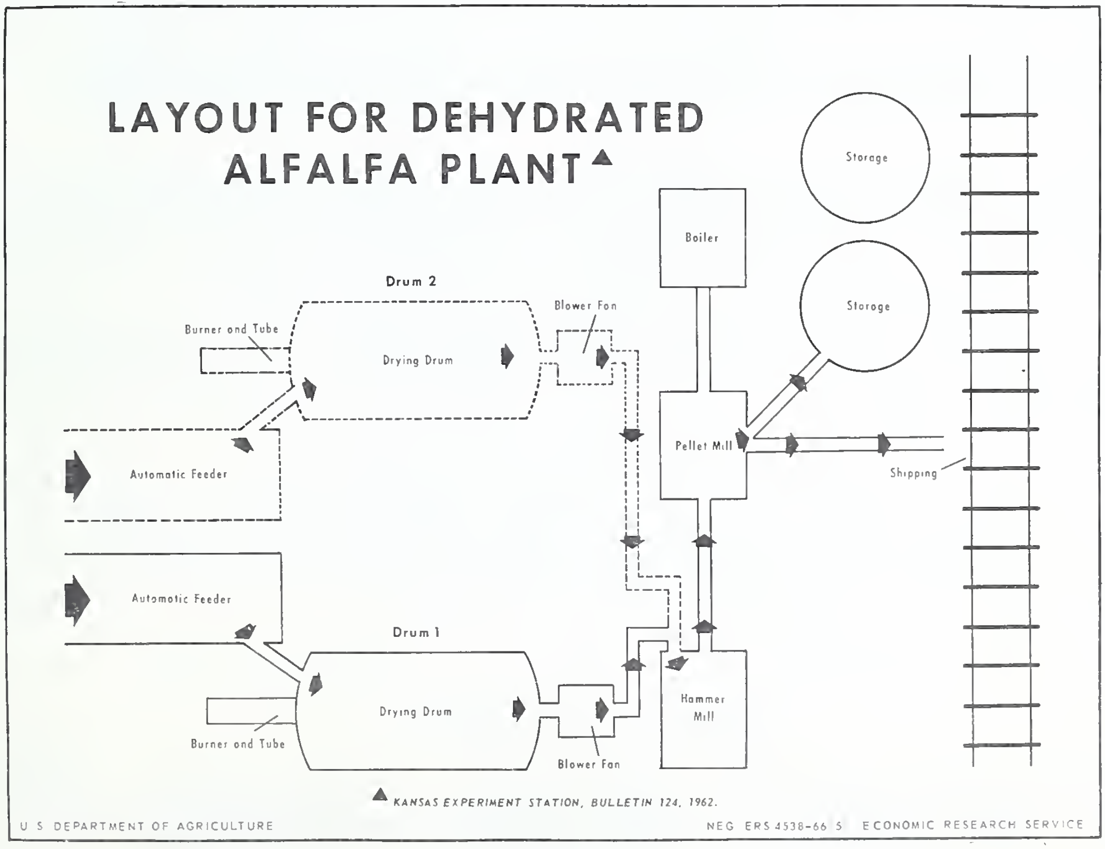
By using the data developed in table 3 to plot the cost curves, it is possible to analyze the effect of a shift in the volume of production on the profit or loss of a plant. If a ton of alfalfa meal sold at $37, the break-even point would be 3,000 tons or $111,000 of sales. Note that a lower output increases loss while a greater output increases profit (fig. 1).

If a ton of alfalfa meal sold at $44, the break-even point would shift to the left. It would then require an output of only 2,000 tons annually to break even. A similar graph can be constructed for costs and returns which vary from the values presented here. By using such a graph, the approximate volume of production required to meet all costs can be determined.

Rather than operate their own land, the majority of dehydrating firms purchase forage from farmers. Farmers are generally paid for alfalfa on the basis of dehydrated weight. Most plant operators purchase the forage as it is required during the haying season. However, some forage is contracted in the spring to insure a stable supply. Contracting is more prevalent in areas of limited hay supply.

The acreage needed per dehydrating plant depends upon both the dehydration capacity of the plant and the annual alfalfa yield per acre. Plant owners attempt to establish the dehydrator within 10 miles of the most distant supply because the raw material is several times as heavy and bulky as the final product--a factor which results in relatively high transport costs. Often, single-drum plants must depend on longer hauls for their supply where they are established in areas with low density of forage production or where alfalfa is grown principally for its beneficial effects upon other crops, as in rotation systems. Therefore, single-drum plants often have higher costs of hauling and higher costs per ton produced. Long hauling distances will be reflected in lower forage prices to the farmer.

The forage is usually cut and field-chopped in one operation, and then hauled by truck to the processing plant. The field operation usually requires two men for the 1-drum plant. At the plant, forage is fed into a dryer and then channeled to other areas of the process (fig. 2). Two men can usually



▲ KANSAS EXPERIMENT STATION, BULLETIN 124, 1962.

Figure 2

operate a single-drum plant. There are some economies of size in the labor requirements for 2- and 3-drum plants.

The alfalfa dehydrating industry is characterized by relatively few firms and imperfect competition. Almost three-fourths of the dehydrating plants in the United States are corporately owned. Other types of ownership, in order of importance, are partnerships, individual proprietorships, and cooperatives.

MARKET DETERMINANTS

To analyze the feasibility of establishing forage dehydrators in a project area, one must look at present supply and demand for dehydrated meal as well as past trends and the projected market outlook.

Supply of Dehydrated Alfalfa

The first alfalfa dehydration system was developed in 1910, with the construction of a plant in Louisiana. It was not until the 1930's that this process was used on a commercial basis. Production of alfalfa meal reached 1 million tons by the 1945-46 production year beginning in May, and since then has increased significantly. During the 1964 feed year beginning in October, over 1,700,000 tons were produced (table 4).

Alfalfa meal is produced primarily in Nebraska, Kansas, and the far western States, particularly California (table 5). These areas account for almost 70 percent of total U.S. production. In the 1962-63 production year, Nebraska and Kansas produced about 45 percent of total production, and California produced 23 percent (11).

Between the 1957-58 and 1962-63 production years, California increased its alfalfa meal production from 187,000 tons to 364,000 tons, or an increase of 95 percent (11). California's increases accounted for 57 percent of the total increase in national production between the above two periods.

In 1954, there were 14 alfalfa dehydrating plants in California. By 1964, the plants had increased to 18, and annual production averaged approximately 12,500 tons per plant.

Production of alfalfa meal has been unimportant in the Northwest. In 1954, there were 10 plants in the area--8 in Washington and 2 in Idaho. By 1964, Washington had only 4 plants and Idaho 1, while 1 plant had been installed in Oregon and 2 in Montana. Although location of production changed between 1954 and 1964, total production in the Northwest changed very little, averaging about 40,000 tons annually.

Seasonality of Production

Alfalfa meal production is characterized by extreme seasonal variation (fig. 3). This variation is directly related to the production cycle of alfalfa. Production is low and fairly stable from November through April, Table 4.--Alfalfa meal production: Dehydrated, suncured, and total, United States, by months, 1957-65

Year beginning October	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
						Dehydrated (1,000 tons)							
1957------	108.2	17.9	4.5	4.2	1.4	10.1	15.5	128.9	228.3	204.4	228.3	164.2	1,115.9
1958------	98.2	12.3	5.0	5.3	5.2	16.3	26.5	124.1	256.4	248.5	219.6	167.8	1,185.2
1959------	88.2	16.3	3.9	3.9	3.8	14.3	24.8	158.2	240.6	265.6	226.9	173.1	1,219.6
1960------	95.2	14.5	5.9	3.7	7.8	19.0	31.5	123.3	275.6	273.6	266.3	186.1	1,302.5
1961------	86.4	12.9	6.7	4.6	4.5	12.7	25.2	175.5	252.6	249.0	264.3	173.7	1,268.1
1962------	119.3	22.1	6.6	5.8	2.0	16.4	30.5	203.9	274.4	276.5	217.9	166.6	1,342.0
1963------	136.5	18.3	7.9	3.8	3.9	17.4	41.8	223.7	333.6	362.1	245.7	212.5	1,607.2
1964------	112.3	10.6	11.4	6.7	8.3	19.1	29.1	178.9	302.2	362.4	295.1	198.6	1,534.7
1965------	151.7	20.1	12.2	10.4	7.7	17.4							
						Suncured (1,000 tons)							
1957------	14.5	16.0	18.2	16.5	14.2	15.7	14.0	13.2	13.9	12.8	15.5	14.2	178.7
1958------	17.1	17.7	22.2	22.6	21.0	19.5	15.0	14.3	14.4	15.7	16.7	18.6	214.8
1959------	18.1	24.1	24.7	19.2	17.5	15.1	14.6	14.1	15.4	16.1	16.9	17.0	212.8
1960------	15.9	23.4	22.5	16.8	16.3	16.2	14.1	12.7	12.9	13.4	13.5	16.3	194.0
1961------	16.5	16.8	18.2	19.7	18.1	20.2	17.2	15.9	17.4	22.4	25.1	23.1	230.6
1962------	27.3	31.1	29.5	30.6	28.1	21.6	17.5	14.6	17.0	18.4	20.9	16.5	273.1
1963------	22.1	23.5	29.0	22.0	23.7	19.4	17.5	16.5	16.4	19.3	21.7	19.2	250.3
1964------	21.1	18.7	18.7	17.4	18.1	19.5	16.1	18.5	20.7	24.3	23.0	25.4	241.5
1965------	26.6	30.7	33.7	29.7	29.7	24.2							
						Total (1,000 tons)							
1957------	122.7	33.9	22.7	20.7	15.6	25.8	29.5	142.1	242.2	217.2	243.8	178.4	1,[illegible]4.6
1958------	115.3	30.0	27.2	27.9	26.2	35.8	41.5	138.4	270.8	264.2	236.3	186.4	1,400.0
1959------	106.3	40.4	28.6	23.1	21.3	29.4	39.4	172.3	256.0	281.7	243.8	190.1	1,432.4
1960------	111.1	37.9	28.4	20.5	24.1	35.2	45.6	136.0	288.5	287.0	279.8	202.4	1,496.5
1961------	102.9	29.7	24.9	24.3	22.6	32.9	42.4	191.4	270.0	271.4	289.4	196.8	1,498.7
1962------	146.6	53.2	36.1	36.4	30.1	38.0	48.0	218.5	291.4	294.9	238.8	183.1	1,615.1
1963------	158.6	41.8	36.9	25.8	27.6	36.8	59.3	240.2	350.0	381.4	267.4	231.7	1,857.5
1964------	133.4	29.3	30.1	24.1	26.4	38.6	45.2	197.4	322.9	386.7	318.1	224.0	1,776.2
1965------	178.3	50.8	45.9	40.1	37.4	1/41.6							

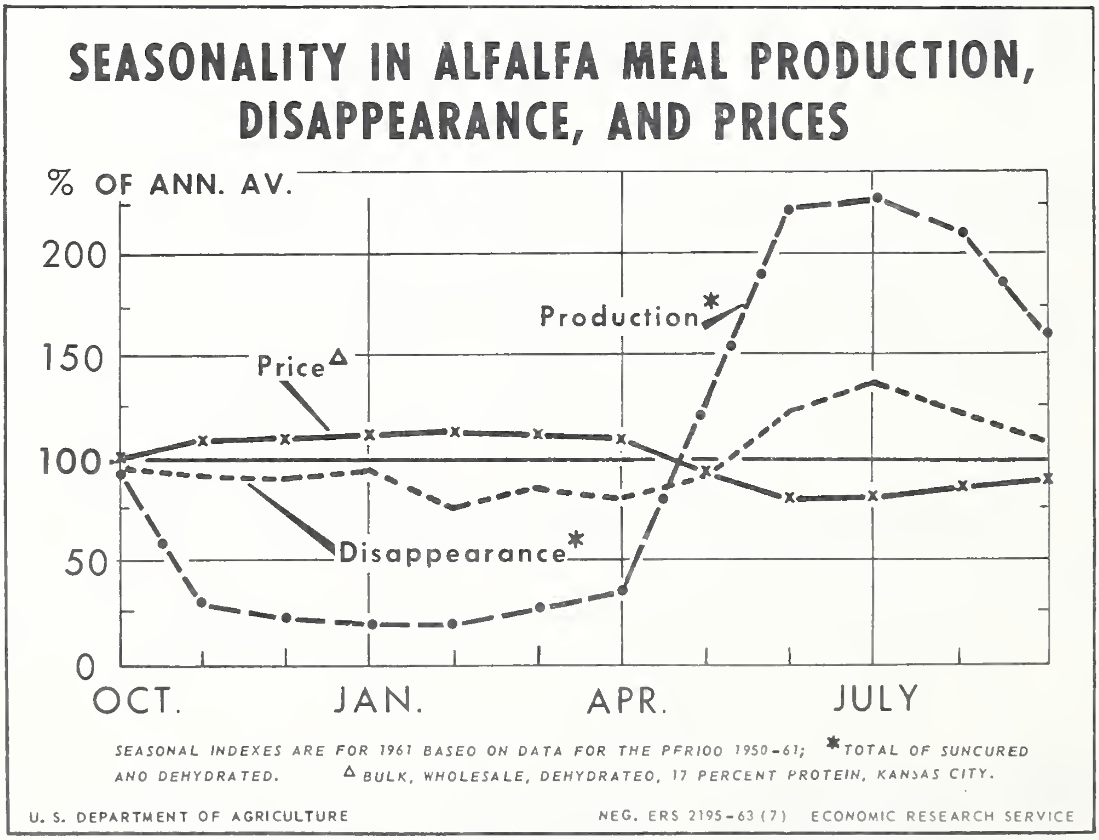
1/ Preliminary.

Source: Compiled from reports of the Grain Division, Consumer and Marketing Service, U.S. Department of Agriculture.

Table 5.--Alfalfa meal: Dehydrated, suncured, and total production, by areas, 1964-65

Producing area	Dehydrated	Suncured	Total
	1,000 tons	1,000 tons	1,000 tons
Nebraska	658.6	18.0	676.6
Kansas	163.5	2.8	166.3
California, Nevada, Arizona, Washington, Oregon	244.1	158.1	402.2
Colorado, Utah, Iowa, Montana	101.0	8.1	109.1
Iowa, Minnesota, North Dakota, South Dakota, Wisconsin	98.9	15.0	113.9
Arkansas, Illinois, Missouri, Kentucky, Indiana	103.0	0	103.0
Texas, Oklahoma, New Mexico	32.3	3.2	35.5
Alabama, Tennessee, North Carolina	8.5	0	8.5
Maryland, Pennsylvania, Ohio, Michigan	160.4	17.6	178.0
Total	1,570.3	222.8	1,793.1

Source: U.S. Department of Agriculture. Feed Market News. Grain Division, Consumer and Mktg. Serv., Vol. 48, No. 19, Washington, D.C., May 12, 1965.



SEASONAL INDEXES ARE FOR 1961 BASED ON DATA FOR THE PERIOD 1950-61; *TOTAL OF SUNCURED AND DEHYDRATED. △ BULK, WHOLESALE, DEHYDRATED, 17 PERCENT PROTEIN, KANSAS CITY.

Figure 3

but swings sharply upward in May, reaches peak outputs in June and July, and begins to taper in September. The increasing importance of artificially dehydrated meal has been mainly responsible for increasing seasonal fluctuations in total production.

The production cycle of suncured alfalfa is fairly stable throughout the year. Meal produced in the winter is primarily from suncured alfalfa produced in California and Arizona, States which have relatively long growing seasons.

Utilization and Consumption

Large quantities of alfalfa meal are utilized during the summer because high production rates result in seasonally lower prices; there is increased seasonal use in mixed livestock and poultry feeds. Another reason for the greater use in summer is that alfalfa meal processors desire to move new meal into marketing channels as rapidly as possible to avoid quality deterioration and costs that would be incurred during prolonged periods of storage. Stocks of alfalfa meal at processing plants accumulate during periods of high production and diminish in periods of low production. About 50 percent of the total annual production occurs during July-September, while about 30 percent of the total amount of disappearance occurs in that period (fig. 3).

Approximately 30 percent of our Nation's alfalfa meal production is sold directly to cattle feedlots. The balance is used by feed manufacturers, who produce formula feeds for hogs, beef, dairy animals, poultry, and sheep.

Dehydrated alfalfa in the feed ration has well-established benefits, such as: (1) Nourishment of rumen micro-organisms, which improves the animal's ability to utilize roughage and make faster weight gains; (2) promotion of early rumen development, which increases the efficiency of feed utilization and promotes rapid growth at younger ages; (3) high content of vitamin A, protein, estrogens, and other nutrients which contribute to a greater response from high-energy feeds, thus improving feeding efficiency and carcass quality; and (4) high content of vital nutrients which serve to increase conception rates, reduce gestation problems, insure healthier, more vigorous offspring, and stimulate milk production.

More advertising of the benefits of dehydrated alfalfa for breeding herds could lead to increased demands in the Northwest. Many ranchers using low-quality, late summer ranges could increase production by using dehydrated alfalfa pellets as a supplemental feed.

Alfalfa Meal Prices

During 1959-64, average prices of alfalfa meal at Kansas City (17-percent protein, dehydrated, wholesale, bulk) for the October-September feeding year ranged from $40.30 to $48.40 per ton. This market usually has lower prices for alfalfa meal than other U. S. regions (table 6).

In recent years, prices of alfalfa meal at California milling points have averaged from $6 to $10 per ton higher than at Kansas City, but have been

Table 6.--Alfalfa meal: Average wholesale prices at selected markets, year beginning October, average 1957-61, annual 1959-64 1/

Market	Average 1957-61	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65
	Dollars per ton						
Buffalo	57.50	60.40	56.25	56.20	59.90	52.60	49.80
Chicago	50.40	52.65	48.70	51.10	51.90	46.70	44.20
Kansas City	45.75	47.60	45.20	47.60	48.40	42.20	40.30
Memphis	51.90	54.00	47.90	50.10	51.40	46.30	43.70
California mills	53.20	54.20	55.00	54.20	55.00	51.50	50.20
Principal markets 2/	47.70	49.50	47.50	48.80	49.70	44.20	42.40

1/ Simple averages of Tuesday quotations, with exception of principal markets which are weighted. Prices are on a basis of bulk, 17-percent protein, dehydrated meal.

2/ Kansas City, California mills, Minneapolis, and Omaha.

Source: Compiled from periodic reports of the Grain Division, Consumer and Marketing Service.

slightly lower than at Buffalo. High regional and export demands for alfalfa meal are reflected in relatively higher prices paid for alfalfa forage by California meal processors.

Prices of alfalfa meal exhibit a seasonal pattern. They are highest in the winter and lowest in summer. The pattern of seasonal price variation is opposite to and considerably less pronounced than the seasonal variation in production (fig. 3).

ANALYSIS OF FEASIBILITY

Upper Willamette RC&D Project Area, Oregon.--The Upper Willamette area can expand alfalfa acreage considerably and obtain the concentration of production required to support efficient dehydrating facilities. Within 10 miles of Harrisburg there is adequate acreage to supply forage for three single-drum dehydrating plants.

Alfalfa dehydrating plants are feasible in the Upper Willamette area because the region has (1) high yields of alfalfa per acre, (2) a long production season, and (3) concentrated areas of suitable acreage. The major obstacles are the necessities of developing a stable market and, to a lesser extent, of providing for stable supplies of forage. Before investment is made in a dehydrating operation, sales commitments should be obtained for the production. Once the feeding efficiency of alfalfa meal is demonstrated, the demand will likely grow. The establishment of livestock feeding trials is one possibility for market promotion.

An alternative to the establishment of a new plant is the addition of dehydrating equipment to an established feed mill. For example, this could be done at a facility near Albany, which now pellets rye grass seed screenings. The advantage of this procedure would be the reduction of the investment required and of the risks associated with market development.

Idaho-Washington RC&D Project Area.--Only a portion of the present acreage in the Idaho-Washington area is being harvested mechanically. Conversion of additional acreage to alfalfa production could reduce the prevailing erosion losses, but market potentials are now inadequate to absorb the resulting forage production.

Establishment of an alfalfa dehydrating plant is not feasible in this area under current conditions because (1) yields are low; (2) generally, only one cutting per year is possible without irrigation; (3) most farmers now grow alfalfa-grass mixtures which have low protein content; (4) steep slopes, suitable for crop conversion to reduce erosion, cause high harvesting and hauling costs; and (5) market potentials are restricted by the area's limited livestock industry.

Assuming that a local market could be developed, a dehydrating operation in this area might be based on irrigated acreage producing two or more cuttings. However, it appears that irrigation development is not feasible on the same lands which are in need of crop conversion because of erosion losses.

Several communications express a note of caution in establishing new plants in these areas under current market conditions. A Nebraska firm, for example, comments, "Regarding market outlet, we would feel almost certain that the finished product originating in Idaho or Oregon would have to be sold in that area, in that it would be very difficult to compete in markets east of these two States. It is possible there would be some outlet to the northwest. As you know, California has a number of alfalfa dehydrating plants and they would no doubt be competitive anywhere in the western United States. At the present time our markets, which are normally the eastern half of the United States, are very low and we are operating at about a break-even basis."

An industry association reports, "Prices for dehydrated alfalfa have been seriously depressed for the last 18 months and many of our well established and experienced operators have been forced into bankruptcy during this period. The story of overproduction and underconsumption is dramatized through this industry. Until livestock numbers and feed manufacturing volume catch up with our current level of production, our industry will remain in its present depressed state."

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